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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,756	12/30/2003	Andrew S. Grover	42.P18169.	9097

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EXAMINER
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WALTER, CRAIG E

ART UNIT	PAPER NUMBER
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2188

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/749,756	<b>Applicant(s)</b> GROVER ET AL.	
	<b>Examiner</b> Craig E. Walter	<b>Art Unit</b> 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 22-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 November 2006 has been entered.

### ***Status of Claims***

2. Claims 22-38 are pending in the Application.

Claims 22-38 are new.

Claims 1-21 are cancelled.

Claims 22-38 are rejected.

### ***Response to Amendment***

3. Applicant's amendments and arguments filed on 13 November 2006 in response to the office action mailed on 6 September 2006 have been fully considered, but they are not persuasive. Therefore, the rejections made in the previous office action are maintained, and restated below, with changes as needed to address the amendments.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 28-33 are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. More specifically, the machine readable media recited in these claims is directed to both statutory (i.e. ASICs) and non-statutory (i.e. carrier waves) subject matter. Please refer to paragraph 0027, all lines of the original specification.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 22-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. More specifically, Applicant contends that the new claims, which recite, *inter alia*, "...determining a threshold number; determining a threshold period of time; monitoring a number of previous consecutive reads of a hard drive (HD) satisfied by non-volatile cache (NVC) of the HD;..." were added specifically to distinguish over previously cited Coulson. Applicant alleges the newly added claims

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limitations are supported at least by paragraphs [0010], [0018], [0021], [0023] and [0024] of the specification, however Examiner asserts that several of the newly added limitations are in fact not supported within these paragraphs. Additionally, Examiner was not able to locate support for these newly added claim limitations after thoroughly re-reviewing the original disclosure (including the original drawings). The following is a description of the newly added limitations that are not supported by the original disclosure:

As for claim 22, the original disclosure fails to disclose, "determining a threshold number". The specification **does support** checking if a predetermined number of HD reads was serviced by the NVC (see Fig. 4, element 402), however the specification **lacks support for actually determining the threshold number**. Applicant concedes this limitation was added to distinguish the claim from Coulson by reciting actually determining a number rather, than simply making use of an already established predetermined number (which incidentally is taught by Coulson per the reasons set forth in the Office action made final on 6 September 2006). The original specification only supports the latter. More specifically, Figs. 4 and 5 of Applicant's original specification disclose branching within the flow charts based on a **predetermined number**. In other words, the original specification supports the number as being previously established, rather than determined dynamically as presented recited in this claim.

As for claim 22, the original disclosure fails to disclose, "determining a threshold period of time". The specification **does support** checking if a HD reads for a predetermined period of time serviced by the NVC (see Fig. 4, element 404), however

the specification **lacks support for actually determining the threshold period of time**. Applicant concedes this limitation was added to distinguish the claim from Coulson by reciting actually determining a period of time rather than making use of an already established predetermined period of time (which incidentally is taught by Coulson per the reasons set forth in the Office action made final on 6 September 2006). The original specification only supports the latter. More specifically, Figs. 4 and 5 of Applicant's original specification disclose branching within the flow charts based on a **predetermined period of time**. In other words, the original specification supports the period of time as being previously established, rather than determined dynamically as presented recited in this claim.

As for claim 22, the newly added limitation "changing a power state of the HD based at least in part on the threshold number, the threshold period of time, the number of previous consecutive reads of the HD satisfied by the NVC of the HD and the period of time of previous consecutive HD reads satisfied by the NVC of the HD" is not fully supported by the original disclosure. More specifically, the original disclosure does not support changing the power of the HD based on either a determined number or a determined threshold period of time as recited in these claims, rather it only supports changing the power state based on a **predetermined number** of HD reads serviced by the NVC, or a **predetermined period of time** the HD reads are serviced by the NVC (see Fig. 4, elements 402 and 404). There is no indication in this claim that the "threshold number" and the "threshold period of time" as presently recited, necessarily correspond to the number of consecutive reads and predetermined period of time the

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HD reads have been satisfied by the cache, respectively; nor is there an indication according to the original specification that power state of a HD can be changed based on "a determined number" or "a determined period of time" as presently recited in this claim.

As for claim 23, the original disclosure fails to disclose, "determining a threshold quantity of memory space". The specification **does support** determining whether a predetermined quantity of the portion of the NVC allocated for dirty data remains available (paragraph 0019, all lines), however the specification **lacks support for actually determining a threshold quantity of memory space**. Applicant's original disclosure additionally fails to disclose wherein the changing the power state of the HD is further based at least in part on the threshold quantity of memory space and the quantity of the NVC that would be available to service HD writes when the HD is spun down (Fig. 4 only supports changing the power state based on a number of reads, period of time serviced by cache, and reads occurring in a period of time serviced by the cache).

As for claim 32, in addition to the lack of support for "determining a threshold number" and "determining a threshold period of time" as disclosed with respect to claim 22, *supra*, the original disclosure fails to disclose "monitoring a number of transactions serviced by the NVC or the HD **within a previous period of time equal to the threshold period of time**"; and wherein the changing the power state of the HD is further based at least in part on the threshold number and the number of transactions serviced by the NVC or the HD **within the previous period of time equal to the**

**threshold period of time**". More specifically (and as discussed with respect to claim 22), the original disclosure only provides support for a predetermined number and a predetermined period of time, not a number and period of time that have been dynamically determined and equated to a predetermined period of time.

As for claim 38, the original disclosure fails to disclose, "determining a second threshold quantity number" and further fails to disclose, "determining a second threshold period of time". As discussed with respect to claim 22, neither "determining a threshold number" nor "determining a threshold period of time are disclosed in the original specification. Additionally, assuming *arguendo* **determining** both a number and a period of time are disclosed, the specification still lacks proper original support for **a second number and a second period of time**.

Claims 24-31 and 33-37 are further rejected under § 112, first paragraph for lack of written description for at least the reasons stated in the rejection of claims 22, 23, 32 and 38 for those claims with similar limitations. Additionally, dependant claims 23, 24, 26, 27, 29, 30, 32, 33 and 35-37 are rejected for inheriting the deficiencies under § 112, first paragraph of each of their respective base claims.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the



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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 22-38 are rejected under 35 U.S.C. 102(e) as being anticipated by

Coulson (US PG Publication 2003/0074524 A1).

As for claims 22 and 34, Coulson teaches a method (as in claim 22 and system as in claim 34) comprising:

- a processor (Fig. 1, element 16 – paragraph 0019, all lines);

- a non-volatile cache (NVC) coupled the processor, the NVC to serve as a cache for a hard drive (HD) of the system (paragraph 0014, all lines – cache is used in conjunction with the HD to improve performance); and

- a machine readable medium having stored thereon a set of instruction which when executed (paragraph 0019, all lines – the controller contains code to execute the processes) cause the system to perform a method including,

- determining a threshold number (paragraphs 0020 through 0021, all lines – the system determines if the cache can service a request, therefore the threshold number is established once a determination is made whether to have the cache or the HD service the request. For example if the cache is full, the threshold number would equal one, meaning the next request would exceed the threshold of the cache, hence requiring the HD to satisfy the request);

- determining a threshold period of time (the threshold period of time is determined based on the time the cache can no longer successfully satisfy the commands – paragraphs 0020 through 0021, all lines);

monitoring a number of previous consecutive reads of a hard drive (HD) satisfied by a non-volatile cache (NVC) of the HD (each command is monitored as to whether the cache can satisfy the request – paragraphs 0020 through 0021, all lines);

monitoring a period of time of previous consecutive HD reads satisfied by the NVC of the HD (again, the cache is monitored during the entire time period the cache is successfully satisfying requests – paragraphs 0020 through 0021, all lines);

changing a power state of the HD based at least in part on the threshold number, the threshold period of time, the number of previous consecutive reads of the HD satisfied by the NVC of the HD and the period of time of previous consecutive HD reads satisfied by the NVC of the HD (the hard drive is spun up once the it has been determined that the a determined number of requests (i.e. cache is full) can no longer be met – paragraphs 0020 through 0021, all lines); and

servicing HD data transactions with the NVC while the HD is spun down (paragraphs 0033 through 0035, all lines – the system will spin down the drive once it is determined that the cache can satisfy the request in order to conserve power).

As for claim 23, Coulson teaches

determining a threshold quantity of memory space (the amount of memory space determined is the amount needed by the cache to service a request – paragraph 0023, all lines);

monitoring a quantity of the NVC that would be available to service HD writes when the HD is spun down (the occupied and unoccupied memory locations of the cache must be monitored in order to ensure that a determination can be successfully made as to whether the cache can satisfy the request); and

wherein the changing the power state of the HD is further based at least in part on the threshold quantity of memory space and the quantity of the NVC that would be available to service HD writes when the HD is spun down (if enough memory is available in the cache to service the request, the drive will remain spun down and the cache will satisfy the request – paragraph 0020, through 0021, all lines).

As for claim 24, Coulson teaches wherein the changing the power state of the HD includes spinning down the HD (paragraphs 0033 through 0035, all lines).

As for claim 26, Coulson teaches

determining a threshold number (paragraphs 0020 through 0021, all lines – the system determines if the cache can service a request, therefore the threshold number is established once a determination is made whether to have the cache or the HD service the request. For example if the cache is full, the threshold number would equal one, meaning the next request would exceed the threshold of the cache, hence requiring the HD to satisfy the request);

determining a threshold period of time (the threshold period of time is determined based on the time the cache can no longer successfully satisfy the commands – paragraphs 0020 through 0021, all lines);

monitoring a number of transactions serviced by the NVC or the HD within a previous period of time equal to the threshold period of time (each command is monitored as to whether the cache can satisfy the request – paragraphs 0020 through 0021, all lines); and

wherein the changing the power state of the HD is further based at least in part on the threshold number and the number of transactions serviced by the NVC or the HD within the previous period of time equal to the threshold period of time (the hard drive is spun up once the it has been determined that the a determined number of requests (i.e. cache is full) can no longer be met – paragraphs 0020 through 0021, all lines).

As for claim 27, Coulson teaches changing the power state as including spinning up the HD (paragraphs 0033 through 0035, all lines).

As for claim 37, Applicant recites very similar limitations as recited in claim 22, however contrasts this claim by utilizing a second threshold number and second threshold period of time. Coulson in fact teaches determining a threshold number and threshold period of time (as per the rejection of claim 22); and since his system is designed to accommodate on-going system power conservation techniques (by spinning up and spinning down the HD based on minimizing the power consumption via the use of the cache), he in fact teaches determining multiple threshold numbers, and

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multiple periods of time as recited during each power cycle (i.e. spin up and subsequent spin down) of the HD.

Claim 25, 28, 29, 30, 31, 32, 33, 35, 36 and 38 are rejected based on the same rationale as claims 23, 22, 23, 24, 23, 26, 27, 23, 24 and 27, respectively.

### ***Response to Arguments***

7. Applicant's arguments filed 13 November 2006 have been fully considered but they are not persuasive.

8. Applicant's remarks with respect to former claims 1, 3-8, 10-15 and 17-21 (i.e. discussion with respect to "predetermined quantity" and "predetermined period of time") are rendered moot, as these claims are no longer pending in the Application. Also note, the recitation of "predetermined quantity" and "predetermined period of time" no longer are present in newly added, pending claims 22-38.

9. As for newly added claim 22, Applicant contends several features of this claim overcome Coulson's disclosure. More specifically, Applicant alleges that four elements (i.e. a threshold number, a threshold period of time, a number of previous consecutive reads of a HD satisfied by a NVC or the HD, and a period of time of previous consecutive HD reads satisfied by the NVC of the HD) help to distinguish the instant claims over previously cited Coulson. Applicant contrasts these newly added features with Coulson, stating that Coulson does not speak to the patentability of these allegedly distinguished elements.

Examiner however maintains that Coulson does in fact speak to the patentability of these elements, and in fact anticipates a threshold number, a threshold period of time, a number of previous consecutive reads of a HD satisfied by a NVC or the HD, and a period of time of previous consecutive HD reads satisfied by the NVC of the HD as discussed in the rejection of claim 22, *supra*.

10. As for newly added independent claims 25, 28, 31 and 34, Applicant further contends that Coulson fails to teach "a threshold quantity of memory space, a quantity of the NVC that would be available to service HD writes when the HD is spun down, a second threshold number, and a second threshold period of time and a number of transactions serviced by the NVC or the HD within a previous period of time equal to the second threshold period of time", however fails to specifically contrast Coulson with each of these elements.

Examiner however maintains that Coulson does in fact speak to the patentability of these elements, and in fact anticipates a threshold quantity of memory space, a quantity of the NVC that would be available to service HD writes when the HD is spun down, a second threshold number, a second threshold period of time and a number of transactions serviced by the NVC or the HD within a previous period of time equal to the second threshold period of time as discussed in the rejection of claims 25, 28, 31 and 34, *supra*.

11. Applicant's assertion that each dependant claim incorporates allowable subject matter by further limiting one of the base claims is rendered moot, as Examiner

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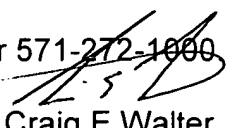
maintains that Coulson in fact anticipates each base claim per the rejections discussed *supra*.

**Conclusion**

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig E. Walter whose telephone number is (571) 272-8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Craig E Walter  
Examiner  
Art Unit 2188

CEW

  
HYUNG S. SOUGH  
SUPERVISOR

2-9-07